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PD-990202

In The Claims:

Please amend the claims as follows:

1. (Currently amended) A multimode transmission system using TDMA comprising:

a TDM switch coupled to a data signal, said data signal comprising a plurality of satellite services, said TDM switch multiplexing said data signal into a TDMA signal comprising a plurality of TDMA transmission frames, each TDMA transmission frame having a plurality of downlink frame time slots, wherein each of said downlink frame time slots is dynamically allocated to one of said plurality of satellite services, which comprise a point-to-point service comprising a portion of said downlink frame time slots dedicated for radiating multiple spot beams, wherein said spot beams are pointed to cover downlink cells, said pointing dynamically scheduled from data queues;

a modulator coupled to said TDM switch and receiving said TDMA signal, said modulator modulating said TDMA signal to generate a modulated TDMA signal; and

a beam-shaping, power-controlling, transmit antenna comprising beam-shaping and power-controlling systems coupled to said modulator and broadcasting said modulated TDMA signal using at least one downlink beam, said at least one downlink

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beam having a shape and number determined by said data signal, said beam-shaping and power-controlling systems enabling TDMA switching between shaped beam modes and spot beam modes of said antenna; and

a processor comprising said data queues, said processor further comprising a power check mechanism checking that required power for said multiple spot beams is less than or equal to a total available radio frequency power in said transmit antenna.

2. (Original) The multimode transmission system using TDMA as recited in claim 1, wherein one of said plurality of services comprises a timing beacon synchronization data signal.

3. (Original) The multimode transmission system using TDMA as recited in claim 1, wherein one of said plurality of services comprises a multi-cast/broadcast data service.

4. (Original) The multimode transmission system using TDMA as recited in claim 3, wherein said multi-cast/broadcast data service comprises a cell-cast function.

5. (Currently amended) The multimode transmission system using TDMA as recited in claim 4, ~~wherein said cell-cast function comprises multi-casting to individual downlink cells within an uplink cell~~ wherein messages from said cell-cast

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function are converted to multi-cast messages as a function of an RF transmission power increase above a regulated limit.

6. (Original) The multimode transmission system using TDMA as recited in claim 1, wherein one of said plurality of services comprises a calibration data signal.

7. (Cancelled) The multimode transmission system using TDMA as recited in claim 1, wherein one of said plurality of services comprises a point-to-point data service.

8. (Original) The multimode transmission system using TDMA as recited in claim 1, wherein each of said plurality of downlink frame time slots is a fixed length of time.

9. (Original) The multimode transmission system using TDMA as recited in claim 1, wherein each of said plurality of downlink frame time slots is a variable length of time.

10. (Original) The multimode transmission system using TDMA as recited in claim 1, wherein said at least one downlink beam has a variable power assigned to ensure link availability and bit-error-rate performance for a coverage area of said at least one downlink beam.

11. (Original) The multimode transmission system using TDMA as recited in claim 10, wherein a transmission information rate of is altered to ensure link

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availability and bit-error-rate performance for a coverage area of said at least one downlink beam.

12. (Currently amended) A satellite system comprising:

a ground station;

a satellite in orbit and in communication with said ground station, said satellite having a multimode transmission system using TDMA comprising:

a TDM switch coupled to a data signal, said data signal comprising a plurality of satellite services, said TDM switch multiplexing said data signal into a TDMA signal comprising a plurality of TDMA transmission frames, each TDMA transmission frame having a plurality of downlink frame time slots, wherein each of said downlink frame time slots is dynamically allocated to one of said plurality of satellite services, which comprise at least one of a broadcast service or a point-to-point service, said point-to-point service comprising a portion of said downlink frame time slots dedicated for radiating multiple spot beams, wherein said spot beams are pointed to cover downlink cells, said pointing dynamically scheduled from data queues;

a modulator coupled to said TDM switch and receiving said TDMA signal, said modulator modulating said TDMA signal to generate a modulated TDMA signal; and

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~~a beam-shaping, power-controlling, transmit antenna comprising beam-shaping and power-controlling systems~~ coupled to said modulator and broadcasting said modulated TDMA signal using at least one downlink beam, said at least one downlink beam having a shape and number determined by said data signal, said beam-shaping and power-controlling systems enabling TDMA switching between shaped beam modes and spot beam modes of said antenna; and

a satellite on-board processor comprising said data queues, said processor further comprising a power check mechanism checking that required power for said multiple spot beams is less than or equal to a total available radio frequency power in said transmit antenna.

13. (Previously amended) The satellite system as recited in claim 12, wherein one of said plurality of services comprises a timing beacon synchronization data signal.

14. (Previously amended) The satellite system as recited in claim 12, wherein one of said plurality of services comprises a multi-cast/broadcast data service.

15. (Previously amended) The satellite system as recited in claim 12, wherein one of said plurality of services comprises a calibration data signal.

16. (Cancelled) The satellite system as recited in claim 12, wherein one of said plurality of services comprises a point-to-point data service.

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17. (Currently amended) A method for satellite system synchronization comprising the steps of:

generating a data signal comprising a plurality of satellite services;

generating a timing signal;

multiplexing said data signal to generate a TDMA signal having a plurality of downlink frames each downlink frame having a plurality of downlink frame slots, wherein each of said plurality of downlink frame slots is dynamically allocated to one of said plurality of satellite services comprising a broadcast service and a point-to-point service, wherein said multi-cast/broadcast data service comprises a cell-cast function;

converting messages from said cell-cast function to multi-cast messages as a function of an RF transmission power increase above a regulated limit;

modulating said TDMA signal to generate a modulated TDMA signal;

broadcasting said modulated TDMA signal using at least one downlink beam, said at least one downlink beam having a shape and number determined by said data signal; and

TDMA switching between shaped beam modes and spot beam modes.